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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LEE, EUGENE

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 02/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/736,651

Applicant(s)

DIERICKX, BART

Examiner

Eugene Lee

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 6-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 6-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 7, 8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Chi et al. 5,608,243. Chi discloses (see, for example, FIG. 2B) an active pixel sensor cell (pixel structure) comprising a p-substrate (semiconductor substrate) 110, image collection region (a region in the substrate for collecting but not storing carriers) 114, source region (one doped or inverted region) 106, and channel region (at least one planar current flow, carrier transport pathway) 112. Regarding the limitation “a region in the substrate for collecting but not storing carriers”, see column 3, lines 52-54 wherein Chi states the junction between the p+ region 114 and drain region 108 forms a photodiode for collecting charges and then states in column 3, lines 61-64, that these charges are swept to the drain region 108 due to a built-in electric field in the junction. Regarding the limitation “radiation sensitive source of carriers in the substrate”, see column 3, lines 55-60 wherein Chi states that photons strike the surface of p+ region 114 and, as a result, create a number of electron-hole pairs. Regarding claim 8, see n-well 108.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chi et al. '243 as applied to claims 1, 7, 8 and 10 above, and further in view of Takemoto et al. 4,148,048. Chi does not disclose a polysilicon cover layer. However, it was extremely well known in the art at the time of invention that polysilicon is one of many conductive materials used in the gate layers of a semiconductor device. Takemoto discloses (see, for example, column 27-33) a gate layer made of polycrystalline silicon layer (polysilicon). It would have been obvious to one of ordinary skill in the art at the time of invention to use polysilicon in the gate layers of Chi in order to have a conductive gate material for applying voltage in the active pixel sensor cell. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Regarding claim 9, Chi does not disclose regions of a second conductivity type in or on the substrate avoiding touching of the region for collecting but not storing carriers. However, Takemoto discloses (see, for example, FIG. 4) a p⁺ diffused layer (regions of a second conductivity type in or on the substrate) 30. In column 6, lines 1-8, Takemoto states that the p⁺ diffused layer is used as an ohmic contact for setting potentials in regions of a semiconductor device. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the p⁺ diffused layer in Chi's invention in order to bias a region for conducting current in the active pixel sensor cell.

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Further regarding claim 9, Chi does not disclose a field oxide. However, Takemoto discloses (see, for example, FIG. 4) a SiO₂ film (field oxide) 26'. In column 14, lines 24-26, Takemoto states that a SiO₂ film serves as an isolation region. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the SiO₂ film (field oxide) of Takemoto in Chi's invention in order to isolate the active pixel sensor cell from other devices.

Response to Arguments

5. Applicant's arguments filed 11/20/03 have been fully considered but they are not persuasive.

Regarding applicant's argument on page 7, third paragraph that Chi discloses the carrier transport pathway stores carriers (as opposed to the applicant's claims which state at least one planar current flow, carrier transport pathway..., in which carrier pathway carriers are not stored), this argument is not persuasive. Chi discloses an active pixel sensor cell comprising a channel region 112 wherein the channel region transports carriers (i.e. electrons) in between an image collection region 114 and a source region 106. The channel clearly does not store carriers but only transports the carriers from the image collection 114 to the source region 106. Current clearly is not a form of storage. In column 4, lines 11-13, Chi states that the conductive channel 112 allows a current **to flow** from the drain region 108 to the source region 106 (the electrons flow from source region 106 to drain region 108).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 703-305-5695. On 2/9/04, the telephone number will be permanently changed to 571-272-1733. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Eugene Lee
January 26, 2004

Tom Thomas

Tom Thomas
Supervisory Patent Examiner
Technology Center 2800